

REMARKS

In the Office Action of May 22, 2003, Claims 32 - 43 were rejected. No claim was allowed. In response, Claim 32 is amended and Claims 33 - 38 and 41 are canceled without prejudice or disclaimer. Reexamination and reconsideration are respectfully requested in view of the foregoing amendments and the following remarks.

The Invention

The present invention is directed to an information recording medium that includes the feature of a first reflective layer and a second reflective layer wherein the first reflective layer is disposed closer to the recording layer than the second reflective layer and contains at least one of Ti, Cr, Co, Ni, Mg, Si, V, Ca, Fe, Zn, Zr, Nb, Mo, Rh, Sn, Sb, Te, Ta, W, Ir, Pb, B and C; and the second reflective layer contains at least one of Al, Cu, Ag, Au, Pt and Pd, and sum of contents of these atoms in the second reflective layer is larger than that of contents of these atoms in the first reflective layer.

This composition of the first and second reflective layers makes the second reflective layer higher in the thermal conductivity and stronger than the first reflective layer. And heat is diffused selectively from the first reflective layer to the second reflective layer (see, for example, page 10, lines 20 -23 of the present specification). Consequently, the information recording medium can provide an enhanced inter-mark thermal interference suppressing effect in the record mode, and a good quality of reproduced signal and a high productivity (see, for example, page 8, lines 15 - 21 of the present specification).

A further feature of the invention is that the information recording medium comprises a third protective layer and a fourth protective layer that comprises any one of an oxide, a nitride and a fluoride, and having a thickness of 2 - 8 nm (see, for example, page 6, line 11 to page 7, line 1 of the present specification). This two-film protective layer can act to prevent the adverse influences caused by the diffusion of the material of the first protective layer into the recording layer (see, for example, page 7, lines 1 - 4 of the present specification).

Rejection of Claims 32 - 40 and 42 - 43 under 35 U.S.C. §102(b) or §103(a) over JP 05-342631

Claims 32 - 40 and 42 - 43 were rejected under 35 U.S.C. §102(b) as anticipated by, or under 35 U.S.C. §103(a) as obvious over JP 05-342631. The Examiner alleges that JP 05-342631 teaches a substrate, a 150 nm tantalum oxide layer, a 30 nm zinc sulfide/silicon dioxide layer, a phase change GeSbTe recording layer, a second 30 nm zinc sulfide/silicon dioxide layer, a second 150 nm tantalum oxide layer, a third 30 nm zinc sulfide/silicon dioxide layer, an Al reflective layer, an adhesive layer and a support. The Examiner alleges that with the exception of claims reciting the thickness of the innermost protective layers, the claims are anticipated or obvious.

This rejection is traversed as it may be applied to the claims as amended herein. In particular, JP 05-342631 does not disclose first and second reflective layers and their respective compositions as set forth in amended independent Claim 32.

Accordingly, it is respectfully submitted that the rejection of Claims 32 - 40 and 42 - 43 under 35 U.S.C. §102(b) and §103(a) over JP 05-342631 is thereby overcome.

Rejection of Claims 32 - 38 under 35 U.S.C. §102(b) over Kawahara

Claims 32 - 38 were rejected under 35 U.S.C. §102(b) as anticipated by Kawahara et al (U.S. Patent No. 5,395,669). The Examiner alleges that Kawahara teaches a substrate, a 70 nm zinc sulfide/silicon dioxide layer, a 40 nm silicon dioxide layer, a 5 nm zinc sulfide silicon dioxide layer, a second 40 nm silicon dioxide layer, a third 170 nm zinc sulfide/silicon dioxide layer, an Al reflective layer, an adhesive layer and a support. The Examiner further alleges that the 5 nm zinc sulfide/silicon dioxide layers correspond to the third and fourth protective layers and the 40 nm silicon dioxide layers correspond to the first and second protective layers.

This rejection is traversed as it may be applied to the claims as amended herein. In particular, Kawahara does not disclose first and second reflective layers and their respective compositions as set forth in amended independent Claim 32.

Accordingly, it is respectfully submitted that the rejection of Claims 32 - 38 under 35 U.S.C. §102(b) over Kawahara is thereby overcome.

Rejection of Claims 32 - 34, 36, 37, 39, 40 and 42 - 43 under 35 U.S.C. §102(b) over Furukawa et al

Claims 32 - 34, 36, 37, 39, 40 and 42 - 43 were rejected under 35 U.S.C. §102(b) as anticipated by Furukawa et al (EP 0376700). The Examiner alleges that Furukawa teaches a substrate, a 150 nm zinc sulfide/silicon dioxide layer, a 10 - 20

nm silicon dioxide layer, a phase change GeSbTe recording layer, a second 10 - 20 nm silicon dioxide layer, a third 150 nm zinc sulfide/silicon dioxide layer, a Ni-Cr reflective layer, an adhesive layer and a support.

This rejection is traversed as it may be applied to the claims as amended herein. In particular, Furukawa does not disclose first and second reflective layers and their respective compositions as set forth in amended independent Claim 32.

Accordingly, it is respectfully submitted that the rejection of Claims 32 - 34, 36, 37, 39, 40 and 42 - 43 under 35 U.S.C. §102(b) over Furukawa is thereby overcome.

Rejection of Claims 32 - 43 under 35 U.S.C. §103(a) over JP 05-0342631 in view of Yoshioka

Claims 32 - 43 were rejected under 35 U.S.C. §103(a) as obvious over JP 05-342631 in view of Yoshioka et al (U.S. Patent No. 5,439,752). The Examiner alleges that Yoshioka teaches that a 20 nm gold layer may be used to protect an underlying reflective layer mainly consisting of aluminum used in a phase change recording medium, discloses the use of aluminum or Al alloys with corrosion resistant additives, discloses the use of three reflective gold layers having thicknesses of 10 - 30 nm for the outside layers and 60 - 130 nm for the middle layer and discloses that the lower dielectric may be 150 nm and the upper 20 nm. The Examiner takes the position that it would have been obvious to modify the invention of JP 05-342631 by adding a gold layer to prevent corrosion of the Al reflective layer as taught by Yoshioka.

This rejection is traversed as it may be applied to the claims as amended herein. As discussed above, JP 05-342631 does not teach or suggest a structure having a first and second reflective layer. Yoshioka does not teach or suggest a structure having a first reflective layer and a second reflective layer wherein the first reflective layer contains at least one of Ti, Cr, Co, Ni, Mg, Si, V, Ca, Fe, Zn, Zr, Nb, Mo, Rh, Sn, Sb, Te, Ta, W, Ir, Pb, B and C and the second reflective layer contains at least one of Al, Cu, Ag, Au, Pt and Pd, and sum of contents of these atoms in the second reflective layer is larger than that of contents of these atoms in the first reflective layer.

Accordingly, it is respectfully submitted that the rejection of Claims 32 - 43 under 35 U.S.C. §103(a) over JP 05-342631 and Yoshioka is thereby overcome.

Rejection of Claims 32 - 38 and 41 under 35 U.S.C. §103(a) over Kawahara in view of Yoshioka

Claims 32 - 38 and 41 were rejected under 35 U.S.C. §103(a) as obvious over Kawahara in view of Yoshioka. The Examiner takes the position that it would have been obvious to modify the Kawahara by adding a gold layer to prevent corrosion of the Al reflective layer as taught by Yoshioka.

This rejection is traversed as it may be applied to the claims as amended herein. As discussed above, Kawahara does not teach or suggest a structure having a first and second reflective layer. Yoshioka does not teach or suggest a structure having a first reflective layer and a second reflective layer wherein the first reflective layer contains at least one of Ti, Cr, Co, Ni, Mg, Si, V, Ca, Fe, Zn, Zr, Nb, Mo, Rh, Sn, Sb, Te, Ta, W, Ir, Pb, B and C and the second reflective layer contains at least

one of Al, Cu, Ag, Au, Pt and Pd, and sum of contents of these atoms in the second reflective layer is larger than that of contents of these atoms in the first reflective layer.

Accordingly, it is respectfully submitted that the rejection of Claims 32 - 38 and 41 under 35 U.S.C. §103(a) over Kawahara and Yoshioka is thereby overcome.

Rejection of Claims 32 - 34, 36, 37 and 39 - 43 under 35 U.S.C. §103(a) over Furukawa in view of Hirotsune

Claims 32 - 34, 36, 37 and 39 - 43 were rejected under 35 U.S.C. §103(a) as obvious over Furukawa in view of Hirotsune et al (U.S. Patent No. 5,958,649). The Examiner alleges that Furukawa teaches optical recording media that comprise a substrate, a lower protective layer, a GeSbTe recording layer, an upper protective layer, a first reflective layer and a second reflective layer. The Examiner further alleges that the first reflective layer has an attenuation factor of less than 4, including the use of materials such as Mo, Ni, Fe, Cr, Ti, W, Ta, Co, Sb, Mg and V, that the thickness of the first layer may be less than 30 nm, preferably less than 15 nm, and that the second reflective layer may contain Al, Cu, Au and alloys thereof with additives Mo, Pd and Pt, with a thickness between 30 and 200 nm. The Examiner further alleges that the reference discloses a polycarbonate substrate, coated with a 125 nm ZnS-SiO₂ film, a 125 nm CrGeSbTe recording film, a 20 nm ZnS-SiO₂ film, a first reflective layer of Mo having a thickness of 15 nm and a second reflective layer of 10 nm of Al and discloses the replacement of Mo with other metals and the replacement of Al with various alloys. The Examiner takes the position that it would

have been obvious to modify Kawahara by adding a second reflective layer to increase the reflectivity.

This rejection is traversed as it may be applied to the claims as amended herein. As discussed above, Kawahara does not teach or suggest a structure having a first and second reflective layer. Hirotune does not teach or suggest that the sum of contents of Ti, Cr, Co, Ni, Mg, Si, V, Ca, Fe, Zn, Zr, Nb, Mo, Rh, Sn, Sb, Te, Ta, W, Ir, Pb, B and C in the second reflective layer is larger than that of contents of these atoms in the first reflective layer as required by amended independent Claim 32.

Accordingly, it is respectfully submitted that the rejection of Claims 32 - 34, 36, 37 and 39 - 43 under 35 U.S.C. §103(a) over Furukawa and Hirotune is thereby overcome.

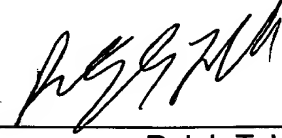
Conclusion

In view of the foregoing amendments and remarks, it is respectfully submitted that Claims 32, 39, 40, 42 and 43 are in condition for allowance. Favorable reconsideration is respectfully requested.

Should the Examiner believe that anything further is necessary to place this application in condition for allowance, the Examiner is requested to contact applicants' undersigned attorney at the telephone number listed below.

Kindly charge any additional fees due, or credit overpayment of fees, to
Deposit Account No. 01-2135 (500.35843CC2).

Respectfully submitted,
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